

Jefferson County Biomass Storage and Processing Facility Initiative



A collaborative effort between private-public sectors

What Is Biomass?

- Biomass is any organic matter-wood, crops, seaweed, animal wastes-that can be used as an energy source. Biomass is probably our oldest source of energy. For thousands of years, people have burned wood to heat their homes and cook their food.
- Biomass is a renewable energy source because its supplies are not limited. We can always grow trees and crops, and people will always produce garbage.

Using Biomass Energy

Burning

We can burn biomass in special plants to produce steam for making electricity, or we can burn it to provide heat for industries and homes.

Bacterial Decay

Bacteria feed on dead plants and animals, producing a gas called **methane**. This is a natural process that happens whenever waste decays. Methane is the same thing as natural gas, the gas sold by natural gas utilities.

Fermentation

Adding a yeast to biomass produces an alcohol called **ethanol**.

Conversion

Biomass can be converted into gas or liquid fuels by using chemicals or heat. That gas can be used to fuel modified internal combustion engines used to power generators that produce electricity.

Sources of Biomass

The most common form of biomass is wood. Only about 20 percent of the wood burned in the United States is used for heating and cooking, the rest is used by industries. Many manufacturing plants in the wood and paper products industry use wood waste to produce their own steam and electricity. This saves these companies money because they don't have to dispose of their waste products and they don't have to buy as much electricity.

Biomass and Jefferson County

Catastrophic wildfires threaten local communities with loss of life and property, and also cause damage to water quality, wildlife, and the recreational and resource values associated with forest land. The economic losses from the 2002 Hayman Fire are estimated at \$238 million, and still climbing.

As of 2003, 33% of Jefferson County's 527,056 inhabitants, or 173,929 residents, resided within the WUI area.

In May 2006, the Front Range Fuels Treatment Partnership (FRFTP) Roundtable identified nearly 1.5 million acres in the Front Range that will require treatment over the next 40 years, at a cost of at least \$15 million per year. This is considerably more than the \$6 million per year presently being spent.

First Steps

County officials decided to conduct a feasibility study to examine ways of using forest biomass for energy production

Study Findings

The feasibility study demonstrated that adequate biomass resources exist to satisfy two primary goals:

- 1.) reduce the risk of wildfires by providing a potential market for the wood waste produced from forest thinnings.
- 2.) provide a long-term, reliable supply of fuel for either a thermal-energy facility or a combined heat and power facility.

The study also identified a significant barrier. It identified that biomass fuel supply reliability and consistency was a major concern of potential end users. Nobody wants to invest money in new technology unless the fuel supply is guaranteed.

Concept

Establish a central site to provide processing and storage capabilities for both forest and urban biomass so that end-users can be assured of a quality, consistent product at a reasonable price. The site will be owned and operated by a private company. The county will support and facilitate the start-up tasks that lead to the development of the project.

Funding

The U.S. Department of Energy (DOE), through the Golden Field Office, is providing a congressional earmark along with county matched funds to support the project.



Collaborative Opportunities

Jefferson County and the Jefferson Economic Council recently formed a group called Energizing Tomorrow. This is a task force is charged with the responsibility of create economic growth in our energy industry in Jefferson County. Jefferson County is home to a regional office of the U.S. Department of Energy; the National Renewable Energy Laboratory; Colorado Energy Research Institute; Colorado Energy Science Center; Colorado School of Mines; and the Colorado Fuel Cell Center. Additionally, numerous companies in Jefferson County are researching, developing, and marketing mostly renewable energy related products. Jefferson County has seen phenomenal growth in the energy industry – 70% in the last five years. The Energizing Tomorrow task force will also look at energy efficiency businesses and support their growth; as well as the use of energy efficiency in buildings throughout County. Additionally, Energizing Tomorrow will: search for public and private funding sources for businesses; develop legislation; market the industry; and address workforce issues. Although Energizing Tomorrow is based in Jefferson County, and focused on Jefferson County businesses, its work will likely have much broader state-wide and possibly federal implications.

The Supply Chain

An important role of any Biomass utilization project will be to coordinate and develop multiple suppliers and supply streams, so that the end-user does not become too dependent upon one source of biomass feedstock. The biomass supply system must be developed to continue to operate even if one component of the system experiences disruptions or shortages. The ability to address seasonality is another important issue. The demand for wood biomass in heating applications is typically highest in the winter months, whereas much of the forest biomass is produced during the other three seasons. It will be necessary for processing facilities to have on-site storage, for raw materials and/or finished products, and a network of year round suppliers, preferably from multiple sectors of the supply system.



The Opportunity

In his 2006 State of the Union address, President Bush stated, “America is addicted to oil.” With those five simple words, the President focused a growing national dialogue on America’s growing dependence on fossil fuels and foreign oil. As our country moves through the early years of the 21st century, there can be little doubt that renewable sources of energy will play an increasingly important role in national security and economic development.

Recent increases in market prices of oil, natural gas, propane, gasoline and coal have created market conditions whereby many utilities, communities, government agencies and individuals are aggressively pursuing the development and implementation of renewable energy technologies. The growing interest in and acceptance of renewable energy, combined with Jefferson County’s forest health conditions, creates a “perfect storm” of opportunity to develop a new bioenergy industry along the Front Range. Biomass is the most versatile of the renewable resources, as it can be used to produce electricity, heat, liquid fuels, intermediate fuels such as pellets, and high value chemicals.